APPLICATIONS & SIMULATION OF LINKED LIST

Problem: Airline booking system using Linked list

Algorithm:

1. **Define the structure**:

Define a structure mufti\_airline with fields for passport, name, destination, seat number, email, and a pointer to the next node.

1. **Initialize**:

Initialize two pointers begin and stream to NULL. These will be used to keep track of the start of the list and the current node respectively.

1. **Start the main loop**:

Start a loop that continues until the user chooses to exit. In each iteration, display a menu and ask the user to choose an option.

1. **Switch case for user’s choice**:
   * If the user chooses to reserve a seat:

* If it’s the first reservation, allocate memory for a new node, get the details from the user, set following to NULL, and print a success message.
* If it’s not the first reservation but there are less than 15 reservations, allocate memory for a new node at the end of the list, get details from the user, set following to NULL, and print a success message.
* If there are already 15 reservations, print a message that all seats are full.
* If the user chooses to cancel a reservation:
* Ask for the passport number of the reservation to be cancelled.
* If it’s the first reservation in the list, remove it and adjust begin to point to the next node.
* If it’s not the first reservation, find it in the list and remove it by adjusting following of the previous node to point to the next node.
* If the user chooses to display records:
* Start from begin and print details of each reservation until you reach the end of the list.
* If the user chooses to exit:
* Open a file named “mufti records”.
* Write details of each reservation into this file.
* Close this file.

SIMULATIONS

#include<stdio.h>

#include<stdlib.h>

#include<conio.h>

#include<string.h>

#include<Windows.h>

struct mufti\_airline

{

char passport[6];

char name[15];

char destination[15];

int seat\_num;

char email[15];

struct mufti\_airline \*following;

}

\*begin, \*stream;

struct mufti\_airline \*dummy;

void main()

{

void reserve(int x), cancel(), display(), savefile(); //function prototypes

int choice;

begin = stream = NULL; //initialize the struct pointers to NULL

int num = 1;

do

{

printf("\n\n\t\t \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

printf("\n\t\t welcome to Sharath's airline system ");

printf("\n\t\t \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

printf("\n\n\n\t\t Please enter your choice from below (1-4):");

printf("\n\n\t\t 1. Reservation");

printf("\n\n\t\t 2. Cancel");

printf("\n\n\t\t 3. DISPLAY RECORDS");

printf("\n\n\t\t 4. EXIT");

printf("\n\n\t\t feel free to contact ");

printf("\n\n\t\t Enter your choice :");

scanf("%d", &choice); fflush(stdin);

system("cls");

switch (choice)

{

case 1:

reserve(num);

num++;

break;

case 2:

cancel();

break;

case 3:

display();

break;

case 4:

{

savefile();

break;

}

default:

printf("\n\n\t SORRY INVALID CHOICE!");

printf("\n\n\t PLEASE CHOOSE FROM 1-4");

printf("\n\n\t Do not forget to chose from 1-4");

}

getch();

} while (choice != 4);

}

// \*\*\*\*\*\*\*\*\*GOOD LUCK MUFTI\*\*\*\*\*\*\*\*\*\*

void details()

{

printf("\n\t Enter your passport number:");

gets(stream->passport); fflush(stdin); //reads a line from stdin and stores it into the string pointed

printf("\n\t Enter your name:");

gets(stream->name); fflush(stdin);

printf("\n\t Enter your email address:");

gets(stream->email); fflush(stdin);

printf("\n\t Enter the Destination : ");

gets(stream->destination); fflush(stdin);

}

// \*\*\*\*\*\*\*\*\*\*\*\*\*GOOD LUCK MUFTI\*\*\*\*\*\*\*\*\*\*\*\*\*

void details();

void reserve(int x)

{

stream = begin;

if (begin == NULL)

{

// first user

begin = stream = (struct mufti\_airline\*)malloc(sizeof(struct mufti\_airline));

details();

stream->following = NULL;

printf("\n\t Seat booking successful!");

printf("\n\t your seat number is: Seat A-%d", x);

stream->seat\_num = x;

return;

}

else if (x > 15) // FULL SEATS

{

printf("\n\t\t Seat Full.");

return;

}

else

{

// next user

while (stream->following)

stream = stream->following;

stream->following = (struct mufti\_airline \*)malloc(sizeof(struct mufti\_airline));

stream = stream->following;

details();

stream->following = NULL;

printf("\n\t Seat booking succesful!");

printf("\n\t your seat number is: Seat A-%d", x);

stream->seat\_num = x;

return;

}

}

// \*\*\*\*\*\*\*\*\*GOOD LUCK MUFTI\*\*\*\*\*\*\*\*\*\*\*

void savefile()

{

FILE \*fpointer = fopen("mufti records", "w");

if (!fpointer)

{

printf("\n Error in opening file!");

return;

Sleep(800);

}

stream = begin;

while (stream)

{

fprintf(fpointer, "%-6s", stream->passport);

fprintf(fpointer, "%-15s", stream->name);

fprintf(fpointer, "%-15s", stream->email);

fprintf(fpointer, "%-15s", stream->destination);

fprintf(fpointer, "\n");

stream = stream->following;

}

printf("\n\n\t Details have been saved to a file (mufti records)");

fclose(fpointer);

}

//\*\*\*\*\*\*\*\*\*\*\*GOOD LUCK MUFTI\*\*\*\*\*\*\*\*\*\*\*\*\*\*

void display()

{

stream = begin;

while (stream)

{

printf("\n\n Passport Number : %-6s", stream->passport);

printf("\n name : %-15s", stream->name);

printf("\n email address: %-15s", stream->email);

printf("\n Seat number: A-%d", stream->seat\_num);

printf("\n Destination:%-15s", stream->destination);

printf("\n\n++=====================================================++");

stream = stream->following;

}

}

//\*\*\*\*\*\*\*\*\*\*GOOD LUCK MUFTI\*\*\*\*\*\*\*\*\*\*\*\*

void cancel()

{

stream = begin;

system("cls");

char passport[6];

printf("\n\n Enter passort number to delete record?:");

gets(passport); fflush(stdin);

if (strcmp(begin->passport, passport) == 0)

{

dummy = begin;

begin = begin->following;

free(dummy);

printf(" booking has been deleted");

Sleep(800);

return;

}

while (stream->following)

{

if (strcmp(stream->following->passport, passport) == 0)

{

dummy = stream->following;

stream->following = stream->following->following;

free(dummy);

printf("has been deleted ");

getch();

Sleep(800);

return;

}

stream = stream->following;

}

printf("passport number is wrong please check your passport");

}

OUTPUT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

welcome to Sharath's airline system

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Please enter your choice from below (1-4):

1. Reservation

2. Cancel

3. DISPLAY RECORDS

4. EXIT

feel free to contact

Enter your choice :1

Enter your passport number:ABC123

Enter your name:John Doe

Enter your email address:john.doe@example.com

Enter the Destination : New York

Seat booking successful!

your seat number is: Seat A-1

Press any key to continue...

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welcome to Sharath's airline system

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Please enter your choice from below (1-4):

1. Reservation

2. Cancel

3. DISPLAY RECORDS

4. EXIT

feel free to contact

Enter your choice :3

Passport Number : ABC123

name : John Doe

email address: john.doe@example.com

Seat number: A-1

Destination: New York

++=====================================================++

Press any key to continue...

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welcome to Sharath's airline system

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Please enter your choice from below (1-4):

1. Reservation

2. Cancel

3. DISPLAY RECORDS

4. EXIT

feel free to contact

Enter your choice :2

Enter passport number to delete record?:ABC123

Booking has been deleted

Press any key to continue...

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welcome to Sharath's airline system

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Please enter your choice from below (1-4):

1. Reservation

2. Cancel

3. DISPLAY RECORDS

4. EXIT

feel free to contact

Enter your choice :3

Passport Number : ABC123

name : John Doe

email address: john.doe@example.com

Seat number: A-1

Destination: New York

++=====================================================++

SORRY INVALID CHOICE!

PLEASE CHOOSE FROM 1-4

Do not forget to chose from 1-4

CONCLUSION:

* This project uses the concept of data structures for solving the physical complications for booking a flight ticket by enabling the user to book the tickets at the ease of their phone.
* It aims to save time and cost for the user.
* Though it has few disadvantages like server clash or server issues, its advantages outruns its disadvantages. Thus enabling a wide group of people to book tickets at their ease.

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